

WHAT IS CLAIMED IS:

1. A compound for increasing the concentration of a parent androgen in a subject in vivo, the parent androgen having a skeletal structure including a 1 position and a 17 position and the parent androgen further having a 17β -hydroxy

5 group comprising a 17β -hydroxy-oxygen appended to the 17 position and a 17β -

hydroxy hydrogen appended to the 17β -hydroxy oxygen, the compound comprising:

a substrate having the skeletal structure of the parent androgen comprising a

1 position and a 17 position corresponding to the 1 and 17 positions respectively of the parent androgen, the substrate comprising a carbon-carbon double bond at the 1 position; and

a promoiety appended to the 17β -hydroxy oxygen of the substrate as a substitute for the 17β -hydroxy hydrogen of the parent androgen, the promoiety comprising an alkylcarbonate ester.

2. A compound as set forth in claim 1, wherein the substrate has the

15 skeletal structure of the parent androgen and wherein the parent androgen is selected from the group consisting of 5α -androst-1-ene- $3\alpha,17\beta$ -diol, 5α -androst-1-ene- $3\beta,17\beta$ -diol, and mixtures thereof.

3. A compound as set forth in claim 1, wherein the substrate has the

20 skeletal structure of the parent androgen and wherein the parent androgen is selected from the group consisting of 5α -estr-1-ene- $3\alpha,17\beta$ -diol, 5α -estr-1-ene- $3\beta,17\beta$ -diol, and mixtures thereof.

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4. A compound as set forth in claim 1, wherein the substrate has the skeletal structure of the parent androgen and wherein the parent androgen comprises 17 β -hydroxy-5 α -androst-1-ene-3-one.

5. A compound as set forth in claim 1, wherein the substrate has the skeletal structure of the parent androgen and wherein the parent androgen is selected from the group consisting of 17 β -hydroxyandrost-1,4-diene-3-one, 17 β -hydroxy-5 α -estr-1,4-diene-3-one, 17 β -hydroxy-5 α -estr-1-ene-3-one, and mixtures thereof.

6. A compound as set forth in claim 1, wherein the alkylcarbonate ester has an alkyl chain length of less than 12.

7. A compound as set forth in claim 1, wherein the alkylcarbonate ester is selected from the group consisting of methyl carbonate, ethyl carbonate, propyl carbonate, isopropyl carbonate, butyl carbonate, isobutyl carbonate, t-butyl carbonate, valeryl carbonate, hexyl carbonate, heptyl carbonate, octyl carbonate, nonyl carbonate, decyl carbonate, dodecyl carbonate, undecyl carbonate, dodecyl carbonate, cyclopentyl methyl carbonate, cyclopentylpropyl carbonate, cyclohexyl methyl carbonate, cyclohexylpropyl carbonate, and mixtures thereof.

8. A compound as set forth in claim 1, wherein the compound comprises 17 β -hydroxy-5 α -androst-1-ene-3-one 17 β -alkylcarbonate.

9. A compound as set forth in claim 1, wherein the compound comprises 17 β -hydroxy-5 α -androst-1-ene-3-one 17 β -ethylcarbonate.

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10. A compound as set forth in claim 1, wherein the compound comprises
17 β -hydroxyandrost-1,4-diene-3-one 17 β -alkycarbonate.

11 A compound as set forth in claim 1, wherein the compound comprises
17 β -hydroxyandrost-1,4-diene-3-one 17 β -ethylcarbonate.

12. A compound as set forth in claim 1, wherein the compound comprises
17 β -hydroxy-5 α -estr-1-ene-3-one 17 β -alkylcarbonate.

13. A compound as set forth in claim 1, wherein the compound comprises
17 β -hydroxyestr-1-ene-3-one 17 β -ethylcarbonate.

14. A compound as set forth in claim 1, wherein the compound comprises
17 β -hydroxyestr-1,4-diene-3-one 17 β -alkycarbonate.

15. A compound as set forth in claim 1, wherein the compound comprises
17 β -hydroxyestr-1,4-diene-3-one 17 β -ethylcarbonate.

16. A compound as set forth in claim 1, wherein the compound comprises
5 α -androst-1-ene-3,17 β -diol 17 β -alkylcarbonate.

17. A compound as set forth in claim 1, wherein the compound comprises
5 α -androst-1-ene-3,17 β -diol 17 β -ethylcarbonate.

18. A compound as set forth in claim 1, wherein the compound comprises
5 α -androst-1-ene-3,17 β -diol 3,17 β -di(alkylcarbonate).

19. A compound as set forth in claim 1, wherein the compound comprises
5 α -androst-1-ene-3,17 β -diol 3,17 β -di(ethylcarbonate).

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20. A compound as set forth in claim 1, further including a carrier.
21. A compound as set forth in claim 1, wherein the carrier comprises a solid carrier.
22. A compound as set forth in claim 1, wherein the carrier comprises a liquid carrier.

23. A compound as set forth in claim 1, wherein the carrier comprises a semi-solid carrier.

24. A method for increasing the concentration of a parent androgen in a subject in vivo, the parent androgen having a skeletal structure including a 1 position and a 17 position and the parent androgen further having a 17 β -hydroxy group comprising a 17 β -hydroxy oxygen appended to the 17 position and a 17 β -hydroxy hydrogen appended to the 17 β -hydroxy oxygen, the method comprising:

administering to the subject a compound comprising a substrate and a promoiety, the substrate having the skeletal structure of the parent androgen comprising a 1 position and a 17 position corresponding to the 1 and 17 positions respectively of the parent androgen, and the substrate comprising a carbon-carbon double bond at the 1 position, the promoiety being appended to the 17 β -hydroxy oxygen of the substrate as a substitute for the 17 β -hydroxy hydrogen of the parent androgen, the promoiety comprising an alkylcarbonate ester; and

20 converting the compound in vivo into the parent androgen.

25. A method as set forth in claim 24, wherein the subject is a human being and the in vivo conversion comprises converting the compound into the parent androgen in vivo within the human being.

26. A method as set forth in claim 24, wherein the substrate has the
5 skeletal structure of the parent androgen and wherein the parent androgen is selected from the group consisting of 5 α -androst-1-ene-3 α ,17 β -diol, 5 α -androst-1-ene-3 β ,17 β -diol, and mixtures thereof.

27. A method as set forth in claim 24, wherein the substrate has the skeletal structure of the parent androgen and wherein the parent androgen is selected from the group consisting of 5 α -estr-1-ene-3 α ,17 β -diol, 5 α -estr-1-ene-3 β ,17 β -diol, and mixtures thereof.

28. A method as set forth in claim 24, wherein the substrate has the skeletal structure of the parent androgen and wherein the parent androgen comprises 17 β -hydroxy-5 α -androst-1-ene-3-one.

15 29. A method as set forth in claim 24, wherein the substrate has the skeletal structure of the parent androgen and wherein the parent androgen is selected from the group consisting of 17 β -hydroxyandrost-1,4-diene-3-one, 17 β -hydroxyestr-1,4-diene-3-one, 17 β -hydroxy-5 α -estr-1-ene-3-one, and mixtures thereof.

20 30. A method as set forth in claim 24, wherein the alkylcarbonate ester has an alkyl chain length of less than 12.

31. A method as set forth in claim 24, wherein the alkylcarbonate ester is selected from the group consisting of methyl carbonate, ethyl carbonate, propyl carbonate, isopropyl carbonate, butyl carbonate, isobutyl carbonate, t-butyl carbonate, valeryl carbonate, hexyl carbonate, heptyl carbonate, octyl carbonate, 5 nonyl carbonate, decyl carbonate, undecyl carbonate, dodecyl carbonate, cyclopentyl methyl carbonate, cyclopentylpropyl carbonate, cyclohexyl methyl carbonate, cyclohexylpropyl carbonate, and mixtures thereof.

32. A method as set forth in claim 24, wherein the compound comprises 17 β -hydroxy-5 α -androst-1-ene-3-one 17 β -alkylcarbonate.

33. A method as set forth in claim 24, wherein the compound comprises 17 β -hydroxy-5 α -androst-1-ene-3-one 17 β -ethylcarbonate.

34. A method as set forth in claim 24, wherein the compound comprises 17 β -hydroxyandrost-1,4-diene-3-one 17 β -alkycarbonate.

35. A method as set forth in claim 24, wherein the compound comprises 15 17 β -hydroxyandrost-1,4-diene-3-one 17 β -ethylcarbonate.

36. A method as set forth in claim 24, wherein the compound comprises 17 β -hydroxy-5 α -estr-1-ene-3-one 17 β -alkylcarbonate.

37. A method as set forth in claim 24, wherein the compound comprises 17 β -hydroxy-5 α -estr-1-ene-3-one 17 β -ethylcarbonate.

20 38. A method as set forth in claim 24, wherein the compound comprises 17 β -hydroxyestr-1,4-diene-3-one 17 β -alkycarbonate.

39. A method as set forth in claim 24, wherein the compound comprises
17 β -hydroxyestr-1,4-diene-3-one 17 β -ethylcarbonate.

40. A method as set forth in claim 24, wherein the compound comprises
5 α -androst-1-ene-3,17 β -diol 17 β -alkylcarbonate.

5 41. A method as set forth in claim 24, wherein the compound comprises
5 α -androst-1-ene-3,17 β -diol 17 β -ethylcarbonate.

42. A method as set forth in claim 24, wherein the compound comprises
5 α -androst-1-ene-3,17 β -diol 3,17 β -di(alkylcarbonate).

10 43. A method as set forth in claim 24, wherein the compound comprises
5 α -androst-1-ene-3,17 β -diol 3,17 β -di(ethylcarbonate).

44. A method as set forth in claim 24, wherein the compound
administration comprises peroral administration.

45. A method as set forth in claim 24, wherein the compound
administration comprises pernasal administration.

15 46. A method as set forth in claim 24, wherein the compound
administration comprises transdermal administration.

47. A method as set forth in claim 24 wherein the compound
administration comprises injecting the compound into the subject.

48. A method as set forth in claim 24, wherein the compound
20 administration comprises administering the compound sublingually.

49. A method as set forth in claim 24, wherein the compound administration comprises complexing the compound with an hydroxypropyl beta cyclodextrin.

50. A method as set forth in claim 24, wherein the compound administration comprises complexing the compound with an hydroxypropyl gamma cyclodextrin.

51. A method as set forth in claim 24, wherein the compound administration comprises administering a dosage periodically for a maximum of two weeks, followed by at least two weeks of non-administration to permit recovery of natural parent androgen production in the subject.

52. A method as set forth in claim 24, wherein the compound administration comprises administering the compound only in morning-time.

53. A method as set forth in claim 24, wherein the compound administration comprises administering the compound in an amount ranging from 15 1.0 mg to 1000 mg per day.

54. A method as set forth in claim 24, wherein the compound administration comprises administering the compound in an amount ranging from 50 mg to 500 mg per day.

55. A method as set forth in claim 24, wherein the compound 20 administration comprises administering the compound in an amount ranging from 100 mg to 400 mg per day.

56. A method as set forth in claim 24, wherein the compound
administration further includes applying an enteric coating to the compound prior
to administering the compound.

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